CLAIMS

1. A radio communications device comprising

   (i) a plurality of antenna elements; and

   (ii) a combiner arranged to adaptively combine said antenna elements such that two or more directional antenna beams are provided which are diverse.

2. A radio communications device as claimed in claim 1 which is a multiple-input multiple-output (MIMO) communications device and wherein the combiner is arranged such that the two or more directional antenna beams are suitable for MIMO communications.

3. A radio communications device as claimed in claim 1 which is selected from a user terminal and a basestation.

4. A radio communications device as claimed in claim 1 wherein said antenna beams are diverse as a result of any of polarisation diversity, angle diversity and space diversity.

5. A radio communications device as claimed in claim 1 wherein said combiner comprises at least one beamformer.

6. A radio communications device as claimed in claim 1 wherein at least some of said antenna elements are provided as a phased array.

7. A radio communications device as claimed in claim 1 wherein a pair of antenna beams are provided with substantially orthogonal polarisations and at substantially similar directions.

8. A radio communications device as claimed in claim 7 wherein a second pair of antenna beams is provided also with substantially orthogonal polarisations to one another and at substantially similar directions but being at a different direction from the first pair of antenna beams.

9. A radio communications device as claimed in claim 1 wherein said combiner is arranged to electronically steer the directional antenna beams.

10. A communications network comprising a plurality of radio communications devices as claimed in claim 1.

11. A method of operating a radio communications device comprising the steps of:

(i) receiving radio signals at a plurality of antenna elements by;

(ii) using a combiner to adaptively combine the antenna elements such that they are operable in at least one direction to receive two or more diverse channels.

12. A method as claimed in claim 11 wherein said radio communications device is a multiple-input multiple-output communications device and wherein said received signals are space-time coded and said diverse channels are multiple-input multiple-output channels.

13. A method of operating a radio communications device comprising the steps of:

(i) transmitting radio signals from a plurality of antenna elements by;

(ii) using a combiner to adaptively combine the antenna elements such that they are operable in at least one direction to transmit two or more diverse channels.

14. A method of operating a radio communications device as claimed in claim 13 which is a multiple-input multiple-output communications device and wherein said radio signals are space-time coded and said diverse channels are multiple-input multiple-output channels.